ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

GEO-8 2000

Groundwater Level Measurement Network:

A cooperative program to monitor the availability of groundwater resources

The Department of Environmental Services (DES) in cooperation with the United States Geological Survey (USGS) monitors and maintains records of surface and groundwater conditions statewide. Groundwater levels in selected observation wells are measured every month on a year-round basis by staff from the New Hampshire Geological Survey (NHGS) at DES.

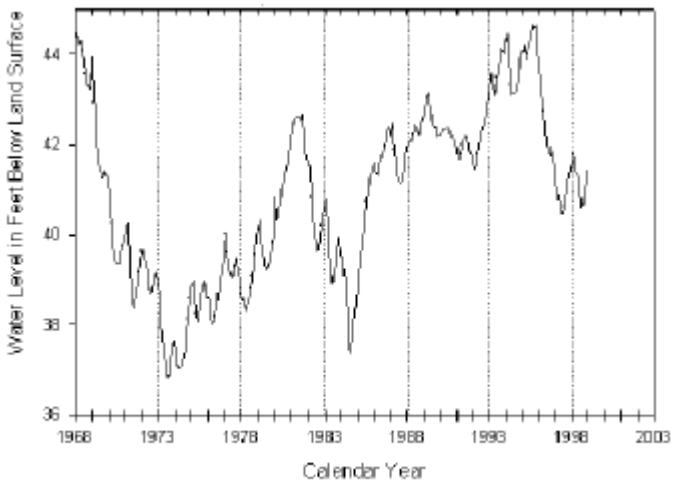

Figure 1: Groundwater Level Measurements for CVW-2 (Vicinity of Concord Airport)

A Story of Rainfall, Runoff, and Changes in Aquifer Storage

Each well serves as an indicator of regional hydrologic conditions, registering changes in the amount of water stored in underground reservoirs known as aquifers. This information can be used to compare conditions today with those existing at some time in the past or to predict future conditions, helping to inform water resources management decisions. For example, such comparisons enable the severity of droughts to be assessed. The record of water level measurements over time, displayed as a hydrograph (Figure 1), not only reveals general hydrologic trends but also contains detailed information about how aquifers with different characteristics respond to hydrologic events of various magnitudes and durations. Such information provides professional hydrogeologists with a better understanding of the role that groundwater plays in the hydrologic cycle.

A Brief History

The observation well program was developed by the USGS and evolved slowly over the years. The oldest well currently in the network is a privately owned dug well (NLW 1) in New London, N.H. and was first measured on October 6, 1947. The second well was added to the program in 1953 and is located near the Lee Town Green (LIW 1). This well is a 40-inch diameter, rock-lined dug well constructed almost 100 years ago in ice-contact deposits of Pleistocene age!

Additional wells were added to the observation well network over time in conjunction with other water resources programs conducted in cooperation with the former New Hampshire Water

Resources Board and other agencies. With the addition of a twelfth well in 1966, the network attained a configuration which would remain unchanged for nearly three decades.

In February 1994, the responsibility for collecting monthly water level measurements was assumed by the DES as a cooperative program with the USGS.

Along with this new responsibility, DES had an opportunity to take advantage of a large population of approximately 475 new USGS observation wells, constructed as part of the cooperative stratified-drift aquifer mapping program (see DES Fact Sheet CO-GEO-5) to expand the program from the original 12-well network into a more comprehensive geographic network.

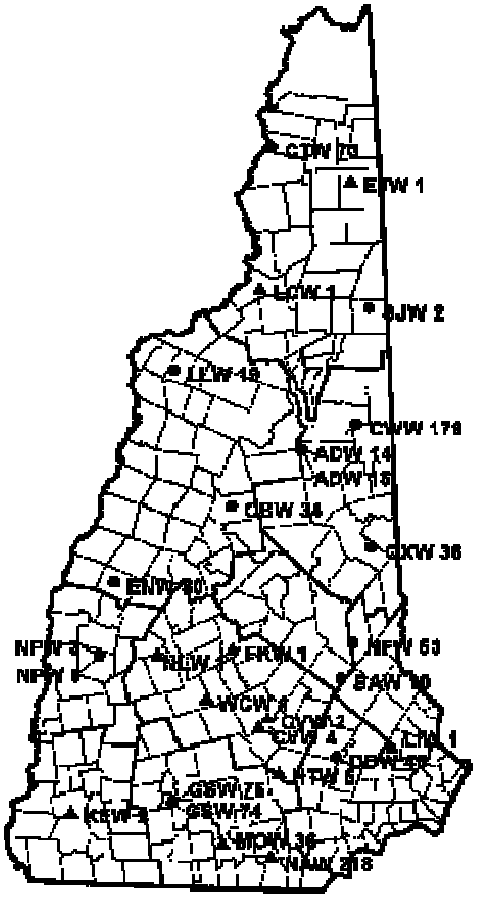

Figure 2: Location of wells in the Groundwater Level Network

The New Expanded Water Level Network

The DES was able to expand the network to its current configuration of 28 wells (see Figure 2) with existing staff resources and the help of volunteer "well readers". A total of eight volunteer readers now monitor water levels at nine sites.

The primary focus for the expanded network was to increase the geographic scope statewide because it was recognized that coverage by the original 12-well network was lacking in some areas.

The secondary focus was on sites that were good indicators of natural hydrologic conditions for their geographic region and had long term reliability.

Preferences were given first to wells located on public lands that were considered relatively safe for long-term use. Land owners were interviewed in person by DES staff and permissions were granted before wells were selected for inclusion as part of the network.

Finally, wells were chosen that had potential to represent specific hydrologeologic settings within stratified-drift, including recharge vs. discharge areas, thin aquifers with a shallow water table vs. thick aquifers with a deep water table, and/or fine vs. coarse grained deposits. Other factors that influenced well selection were proximity to public water supply wells or other large groundwater withdrawals, proximity to surface water bodies, and recognition of aquifers of local importance.

Maintenance and Development

In the spring of 1995, all of the network wells were surged and developed by DES staff to insure a good hydraulic connection between the well and aquifer.

Current Status

DES has provided volunteers with the necessary equipment and instruction to insure that recorded measurements are uniformly and accurately collected. All water levels are measured and recorded monthly at 28 sites. The data are subsequently transferred to the USGS for analysis and publication in the monthly report "Current Water Resources Conditions in Central New England" and the report "Water Resources Data - New Hampshire and Vermont". This data can be accessed directly at: **http://nh.water.usgs.gov/WaterData/curr.htm**.

For more information about the program or information about becoming a volunteer reader, contact the Department of Environmental Services, New Hampshire Geological Survey at (603) 271-1973. For information about obtaining publications, contact the United States Geological Survey - Publications Unit at (603) 226-7800 ext. 7835.